

CLAIMS:

WHAT IS CLAIMED IS:

1. Apparatus operatively positionable within a subterranean well, comprising:
  - a mandrel;
  - a double acting slip and a single acting slip disposed relative to the mandrel,
    - the double acting slip being spaced axially apart from the single acting slip; and
  - a seal element carried on the mandrel.
2. The apparatus according to Claim 1, where the mandrel is disposed axially between the double acting slip and the single acting slip.
3. The apparatus according to Claim 1, further comprising first and second wedges disposed at least partially radially between the double acting slip and the mandrel, and a third generally conical wedge disposed at least partially radially between the single acting slip and the mandrel.
4. The apparatus according to Claim 1, wherein the double acting slip is radially outwardly extendable relative to the mandrel by displacing the second wedge in a first axial direction relative to the mandrel, and wherein the single acting slip is radially outwardly extendable relative to the mandrel by displacing the single acting slip in a second axial direction, opposite to the first axial direction, relative to the mandrel.
5. The apparatus according to Claim 4, further comprising first and second pistons carried on the mandrel axially between the second wedge and the single acting

slip, each of the first and second pistons displacing one of the second wedge and the single acting slip in a respective one of the first and second axial directions when fluid pressure is applied to the first and second pistons.

6. The apparatus according to Claim 5, further comprising an axially extendable internal ratchet assembly configured to prevent reduction of the axial distance between the second wedge and the single acting slip.
7. The apparatus according to Claim 5, further comprising a release sleeve releasably coupled to the mandrel, preventing movement of the third wedge in the second axial direction when the release sleeve is coupled to the mandrel and allowing movement of the third wedge in the second axial direction when the release sleeve is decoupled from the mandrel.
8. The apparatus according to Claim 7, further comprising means for decoupling the release ring from the mandrel.
9. The apparatus according to Claim 7, further comprising:
  - a split ring carried between the mandrel and the release sleeve, the split ring engaging both the mandrel and the release sleeve when its split is closed and not engaging the mandrel when its split is open.
10. The apparatus according to Claim 9, further comprising:
  - flanges carried on the split ring on each side of its split, and
  - a clamp having a first position in which it holds the flanges together and having a second position in which it allows the flanges to separate.

11. The apparatus according to Claim 10, further comprising means for moving the clamp from its first position to its second position.
12. The apparatus according to Claim 1, wherein the double acting slip is a one piece barrel slip.
13. A packer settable within a tubular structure, the packer comprising:
  - a mandrel;
  - first and second axially spaced apart slips disposed relative to the mandrel, the first and second slips being radially outwardly extendable into gripping engagement with the tubular structure when the packer is set therein, the first slip resisting a load applied to the mandrel in a first axial direction, and the second slip resisting another load applied to the mandrel in a second direction, opposite to the first direction;
  - a seal element carried about the mandrel, the seal element being radially outwardly extendable into sealing engagement with the tubular structure when the packer is set therein, a pressure differential in the first axial direction applied to the seal element being resisted by the second slip.
14. The apparatus of Claim 13, wherein the seal element is carried between the first and second slips.
15. The apparatus of Claim 13, further comprising first and second wedge members, the first wedge member being disposed at least partially between the first slip and

the mandrel, and the second wedge member being disposed at least partially between the seal element and the second slip.

16. The packer according to Claim 13, wherein the first slip is a single acting slip and the second slip is a double acting slip.

17. The packer according to Claim 13, further comprising a third wedge member, the second slip being disposed at least partially between the second and third wedge members.

18. A method of securing an apparatus within a tubular structure disposed in a subterranean well, the method comprising the steps of:

disposing a double acting slip and a single acting slip axially spaced apart on the apparatus;

positioning the apparatus within the tubular structure;

radially outwardly extending the double acting slip and the single acting slip, each of the double acting slip and single acting slip grippingly engaging the tubular structure; and

radially outwardly extending a circumferential seal element into sealing engagement with the tubular structure.

19. The method of Claim 18, wherein the seal element is disposed axially between the double acting slip and the single acting slip.

20. The method of Claim 18, further comprising disposing first and second wedges at least partially radially between the double acting slip and a generally tubular mandrel.

21. The method of Claim 20, further comprising disposing a third wedge at least partially radially between the single acting slip and the mandrel.
22. The method according to Claim 21, wherein radially outwardly extending the double acting slip is performed by displacing the second wedge in a first axial direction relative to the mandrel and displacing the single acting slip in a second axial direction, opposite to the first axial direction, relative to the mandrel.
23. The method according to Claim 22, further comprising disposing first and second annular pistons on the mandrel, and applying fluid pressure to the pistons, thereby causing each of the first and second pistons to displace one of the second wedge and the single acting slip.
24. The method according to Claim 23, further comprising releasably coupling the third wedge to the mandrel.
25. The method according to Claim 24, further comprising decoupling the third wedge from the mandrel, and thereby releasing the apparatus from the tubular structure.